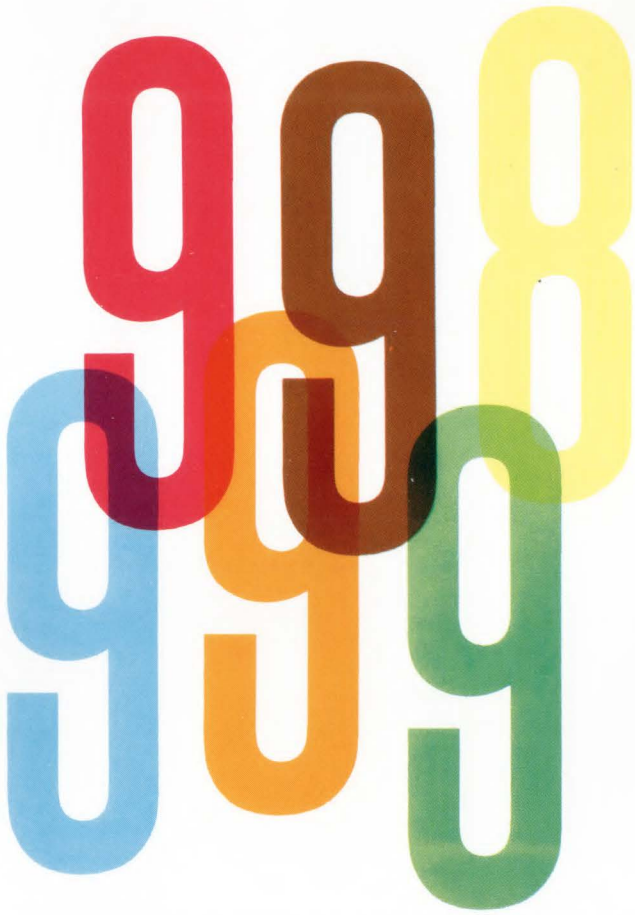


HIGH RESOLUTION
HEAVY DUTY
STANDARD OUTPUT

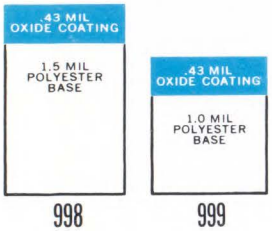
"Scotch" Brand Magnetic Tape for Instrumentation

®

A tape capable of the high frequency performance and ruggedness demanded in Predetection Recording

● The wide band recording equipment used in predetection recording needs a special tape to take full advantage of its capabilities; a tape that can handle the much shorter wavelengths yet tough enough to give long, reliable tape life. To answer this need 3M developed Heavy Duty Instrumentation Tape No. 999—an advanced version of the popular standard No. 599.

High Resolving Power: "SCOTCH" BRAND No. 999 features a .43 mil coating of high potency oxide, applied in a special way to assure an *ultra-smooth* coating surface. This smoother surface provides more intimate head-to-tape contact to allow superior high frequency response, higher resolution, and subsequently better pulse packing potential. Since predetection recording depends on faithful reproduction of very high frequencies, this feature is very important.



High Resolution Heavy Duty Standard Output tapes shown in cross section.

It is also important to other applications involving video band, wide range recording.

Low Dropout Characteristics: The closer head-to-tape contact possible with 999's smoother coating would cause ordinary tape binders to break down and cause dropouts. A specially developed high temperature binder for No. 999 provides greater resistance to heat and friction, yet is formulated to permit perfectly smooth, even application of the high potency oxide. Not only does the more durable binder help prevent dropouts, but the very smoothness of the coating surface itself helps eliminate the more serious causes of dropouts—namely those resulting from protruding foreign particles, etc.

Long Wear: Like all "SCOTCH" BRAND tapes, Nos. 998 and 999 feature 3M's exclusive Silicone lubrication. Impregnated through the coating, this dry, lifetime lubrication further assures smooth tape motion over sensitive recording heads, minimizes tape wear from friction, and extends the life of both the tape and heads.

Standard Sizes Available: While No. 999 is the tape recommended for predetection use, tape No. 998 has the same .43 mil ultra-smooth coating, thus the same excellent magnetic characteristics and ruggedness. The difference between the two is the base thickness: No. 998 is 1.5 mil polyester, No. 999 is 1-mil polyester base for 50% extra recording time. Tape No. 999 is available in popular standard tape widths, ¼", ½", ¾" and 1". Standard lengths for 999 are 1800', 3600' and 7200'. No. 998 is *available only on special order*, subject to minimum quantity order requirements. Contact 3M Magnetic Products Division, St. Paul, for special order information on No. 998. Tapes are supplied in standard widths and lengths, on NAB hubs, NAB reels, and on corrosion-free, aluminum tapered precision reels, or heavy duty precision reels.

Predetection Recording: Predetection recording requires hetrodyning a receiver's IF carrier so that the new IF carrier and its sidebands fit within the passband of the recorder. Extremely wide range, some predetection recording systems are capable of recording frequencies up to 1.5 megacycles.

This unique recording technique, recording the entire signal—carrier and data combined—eliminates much of the distortion and signal losses inherent to common post-detection systems. The electronically uncluttered process not only assures against equipment signal losses, but also simplifies the physical setup needed for a complete data collection station—involving little more than an antenna, receiver and the wide-band recorder.

Predetection Tape No. 999 is tested and developed on actual predetection equipment to assure compatibility with predetection recording systems used in the field. No. 999's high resolving power, excellent S/N ratio and freedom from amplitude instability (capable of providing third and fourth generation copies virtually duplicating the original), combine with the built-in error freedom of the predetection recording process to offer a new dimension of reproduction quality.

998 999

1.5 MIL BASE 1.0 MIL BASE

PHYSICAL PROPERTIES

	998	999
Color	Black	Black
Base Material	Polyester	Polyester
Thickness in Mils		
Base	1.45	.92
Coating	.43	.43
Total	1.88	1.35
Slitting Tolerances—inches	+.000	+.000
	—.004	—.004
Ultimate Tensile Strength		
¼″ Wide—Room Conditions	9#	7#
PSI—Room Conditions	25,000	25,000
PSI @ 150°F.	20,500	20,500
Yield Strength		
5% Stretch in ¼″ Width	5.4#	3.6#
Elongation at Break	100%	100%
Coefficient of Friction	0.33	0.33
Residual Elongation	0.5%	0.5%
Toughness		
Tear—grams	26	12
Impact—kg—cms	100	70
Coefficient of Expansion*		
Humidity (units per % RH change)	1.1×10^{-5}	1.1×10^{-5}
Temperature (units per °F.)	2×10^{-5}	2×10^{-5}
Temperature Limits for Safe Use		
Low	— 40°F.	— 40°F.
High	+225°F.	+225°F.
Wear Ability**	15	15

*These coefficients are unitless and represent the change per % relative humidity or degree Fahrenheit over the following ranges:

Humidity: 20% to 80% RH

Temperature: +30° to +130°F.

**Reference is the wearability of standard instrumentation tape No. 408 considered as unity. Wearability of other tapes are related to No. 408 as multiples of it.

MAGNETIC PROPERTIES

	No. 998	No. 999
Intrinsic Coercivity (H_{ci})—oersteds	240	240
Retentivity (B_{rs})—gauss	875	875
Remanence (flux lines/½″ tape)	1.2	1.2
Output at 1% Distortion—db†		
10 Mil Wave Length	+3.0	+3.0
Sensitivity—db†		
10 Mil Wave Length	+0.0	+0.0
1 Mil Wave Length	+1.5	+1.5
½ Mil Wave Length	+3.0	+3.0
¼ Mil Wave Length	+4.0	+4.0
⅛ Mil Wave Length	+6.0	+6.0
Erasing Field—oersteds	800	800
Uniformity at 10 Mil Wave Length		
Within a Roll	± 3%	± 3%
Roll to Roll	±10%	±10%

†Output and sensitivity measurements are taken on typical predetection equipment using optimum bias for the tape under test. Data is related to the performance of "Scotch" Brand standard instrumentation tape No. 408, likewise measured under optimum bias conditions, by designating it as the zero reference.

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